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SURVIVAL AND GROWTH OF OUTPLANTED LOBLOLLLY PINE AFFECTED WITH TIP BLIGHT - THREE YEAR MEASUREMENTS

by

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Abstract

Significant (<.05) differences were observed in height growth of tip-blight infected vs. healthy loblolly pine seedlings at two locations (the Kisatchie and Bienville National Forests) three years after outplanting. Significant differences (<.01) in survival and diameter were found only on the Kisatchie site. Data from the first summer of outplanting suggested a direct correlation between rainfall and survival at the Kisatchie site.

INTRODUCTION

Tip blight infection occurred on loblolly pine (Pinus taeda L.) seedlings at forest nurseries in several Gulf and mid-south states during the summer of 1979. In order to determine whether survival, height and diameter differences occurred following outplanting, a field evaluation was established in December 1979 at two locations. Three-growing seasons after outplanting, seedlings were reexamined on the two sites; one at the Stuart Seed Orchard on the Catahoula Ranger District of the Kisatchie National Forest, and the other at Tallahala Creek on the Strong River RD of the Bienville National Forest. The Stuart Orchard results at two years indicated highly significant differences (<.01) in survival, height and diameter while data from the Bienville indicated less significant (<.1) differences in height and diameter growth. Comparison of survival data showed no significant differences at the Bienville site.

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RESULTS

Table 1 summarizes the survival patterns at the two sites after three years. Differences are nearly identical to previous results (Affeltranger and Covington, 1982; Affeltranger, 1981).

Table 1. Survival percentage of tip-blight infected and healthy loblolly pine outplanted in December 1979 - February, 1983.

		REPLICATES					
LOCATION	CONDITION	1	2	3	4	5	MEAN
Stuart Seed Orchard	Tip - Blight	40	64	16	36	48	41
	Healthy	68	76	76	52	64	*67
Bienville N.F.	Tip - Blight	84	60	80	92	72	78
	Healthy	88	84	92	88	84	N.S.87

*Significant at the .01 level.

In every paired comparison (replicate) at the Stuart Orchard the healthy seedlings outsurvived the tip-blighted ones. The average survival was 67% and 41% respectively. This site received 9.45 inches of rainfall between July and September 1980.

Table 2 shows a comparison of the heights of these seedlings.

Table 2. Heights (cm) of tip-blight infected and healthy three-year old seedlings.

		REPLICATES					
LOCATION	CONDITION	1	2	3	4	5	MEAN
Stuart Orchard	Tip - Blight	111	102	91	117	96	100
	Healthy	120	119	116	125	130	**122
Bienville NF	Tip - Blight	132	124	162	126	135	135
	Healthy	160	161	157	170	152	*160

**Significant at the .01 level.
*Significant at the .05 level.

Average control vs. diseased seedling height growth was significantly different at both sites. Only one replicate failed to follow this pattern (Bienville #3).

Table 3 presents a comparison of means of root collar diameter measurements.

Table 3. Root collar diameters (mm) of tip-blighted and healthy loblolly pine outplanted in December, 1979 - February, 1983.

		REPLICATES					
LOCATION	CONDITION	1	2	3	4	5	MEAN
Stuart Orchard	Tip - Blight	27	24	23	26	22	25
	Healthy	34	34	29	32	34	***33
Bienville NF	Tip - Blight	25	19	30	20	22	23
	Healthy	27	30	27	29	26	N.S.28

***Significant at the .005 level.

The outstanding difference in the evaluation was seen in diameter growth at the Stuart Seed Orchard. As with height data, replicate 3 on the Bienville National Forest showed a larger mean diameter for the tip-blighted seedlings. This reversal in trend skewed the means and precluded observation of any significant difference on site.

DISCUSSION

Rowan (1982) stated that no differences were detected in survival percentages of tip-blighted versus healthy loblolly and slash pines after two years. He did not discuss growth differences. We attribute the significant differences in survival and growth at the Stuart Seed Orchard to the drought in the first summer of outplanting. The drought was not as severe on the Bienville plot. Rainfall readings, taken in nearby Raleigh, indicated that four more inches fell there than on the Stuart plot during the same summmer period.

REFERENCES CITED

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